

ABSTRACT OF THE DISCLOSURE

Microfluidic analytical devices and systems have at least one porous element disposed downstream of one or more optical detection regions in a pressure-based separation system. A porous element elevates the backpressure within an optical detection region, thus suppressing
5 bubble formation and enhancing optical detection. Various types of porous elements include porous membranes, packed particulate material, and polymerized monoliths. Preferred devices may be fabricated with substantially planar device layers, including stencil layers, that are directly bonded without adhesives to form a substantially sealed microstructure suitable for performing pressure-based chromatographic separations at elevated operating pressures and
10 with organic solvents.